

OKI Semiconductor

MSM538001E

1,048,576-Word x 8-Bit MASKROM

DESCRIPTION

The OKI MSM538001E is a high-speed silicon gate CMOS Mask ROM with 1,048,576-word x 8-bit capacity. The MSM538001C operates on a single 5.0V power supply and is TTL compatible. The chip's asynchronous I/O requires no external clock assuring easy operation. A power-down mode provides low power dissipation when the chip is not selected. The CE and OE pins are provided as control signals that permit three-stated output allowing easy memory expansion on a system bus. The MSM538001E is suited for use as large capacity fixed memory for microcomputers and data terminals.

FEATURES

- Single 5.0V power supply

- 1,048,576 words x 8-bit

- Access time

 - 100ns MAX

- Input/Output TTL compatible

- Tri-State output configurations

- Internal powerdown function

- Packages

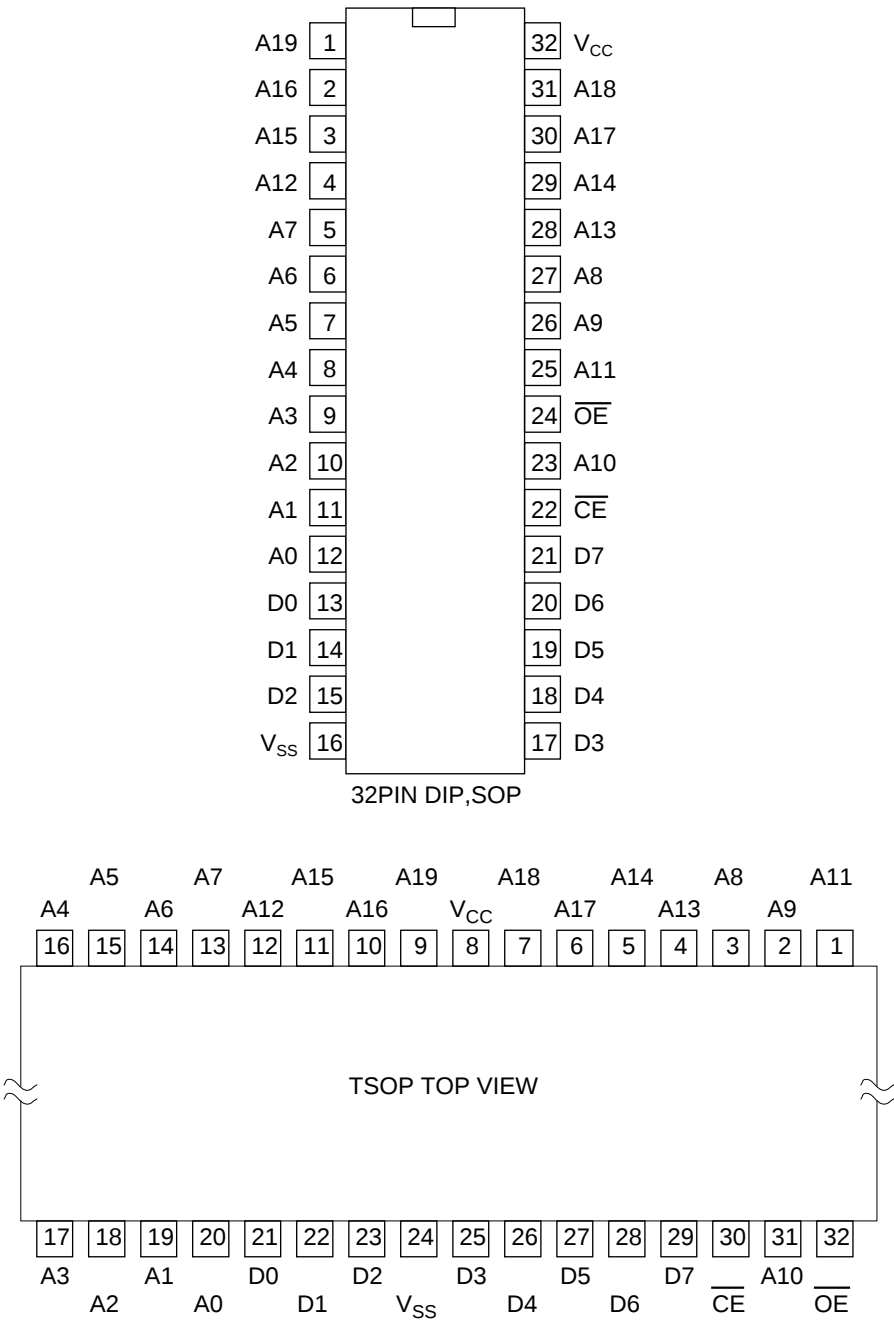
 - 32-Pin plastic DIP (DIP32-P-600-2.54) (MSM538001E-XXRS)

 - 32-Pin plastic SOP (SOP32-P-525-1.27-K) (MSM538001E-XXGS-K)

 - 32-Pin plastic TSOP (TSOP32-P-814-0.50-1K) (MSM538001E-XXTS-K)

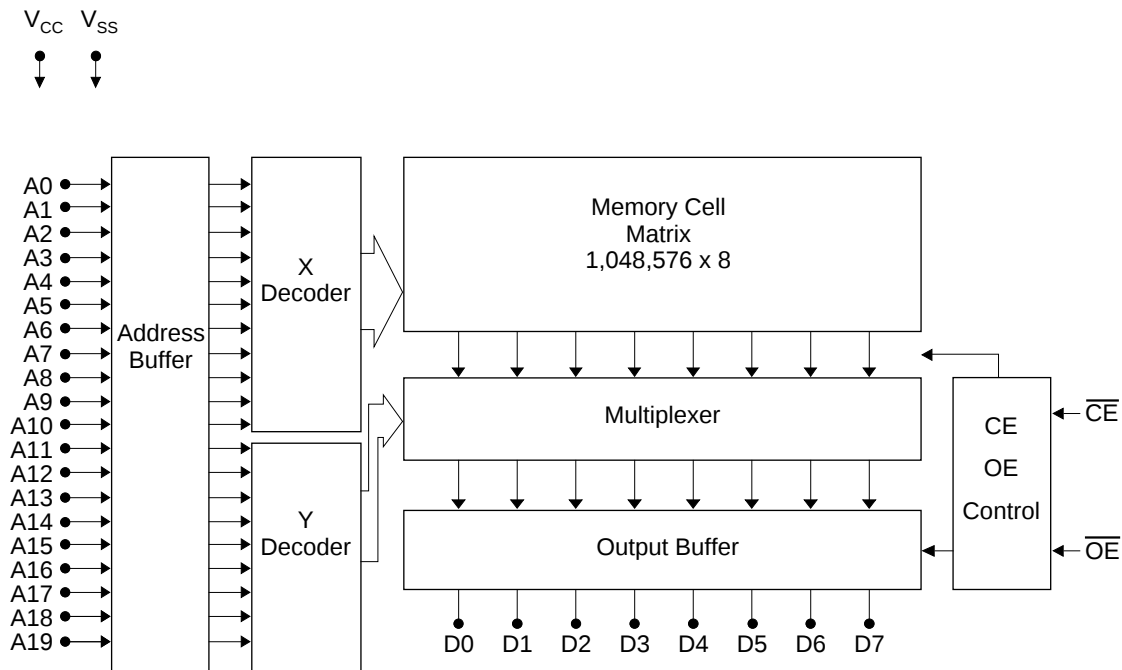
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PIN CONFIGURATION



Pin Name	Function
A0 to A19	Address input
D0 to D7	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
V_{CC}, V_{SS}	Power supply

BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Rated Value	Unit
Power Supply Voltage	V_{CC}	to V_{SS}	-0.3 to 7	V
Input Voltage	V_I		-0.3 to $V_{CC} + 0.5$	V
Output Voltage	V_O		-0.3 to $V_{CC} + 0.5$	V
Power Dissipation	P_D	Per Package $T_{opr} = 25^\circ\text{C}$	1.0	W
Operating Temperature	T_{opr}	—	0 to 70	$^\circ\text{C}$
Storage Temperature	T_{stg}	—	-55 to 150	$^\circ\text{C}$

Recommended Operating Conditions

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	—	4.5	5.0	5.5	V
	V_{SS}	—	0.0	0.0	0.0	V
"H" Input Voltage	V_{IH}	—	2.2	5.0	$V_{CC} + 0.5$	V
"L" Input Voltage	V_{IL}	—	-0.3	0.0	0.8	V
Operating Temperature	T_{opr}	—	0	—	70	$^\circ\text{C}$

DC Characteristics

 $(V_{CC} = 5V \pm 10\%, T_a = 0 \text{ to } 70^\circ\text{C})$

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	V_{OH}	$I_{OH} = -400\mu\text{A}$	2.4	—	—	V
"L" Output Voltage	V_{OL}	$I_{OH} = 2.1\text{mA}$	—	—	0.4	V
Input Leakage Current	I_{LI}	$V_I = 0 \text{ to } V_{CC}$	-10	—	10	μA
Output Leakage Current	I_{LO}	$V_O = 0 \text{ to } V_{CC}$ $\overline{CE} = V_{IH \text{ MIN}}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$\overline{CE} = V_{IL}, \overline{OE} = V_{IH}, t_C = 100\text{ns}$	—	—	40	mA
Power Supply Current (Standby)	I_{CCS1}	$\overline{CE} = V_{CC} - 0.2V$	—	—	50	μA
	I_{CCS}	$\overline{CE} = V_{IH \text{ MIN}}$	—	—	500	μA

AC CHARACTERISTICS

Timing conditions

Parameter	Conditions
Input Signal Level	$V_{IH}=2.4V$, $V_{IL}=0.6V$
Transtion Time	$t_r=t_f=5ns$
Timing Reference Level	Input Voltage=1.5V Output Voltage=0.8V&2.0V
Load Condition	CL=100pF+1TTL

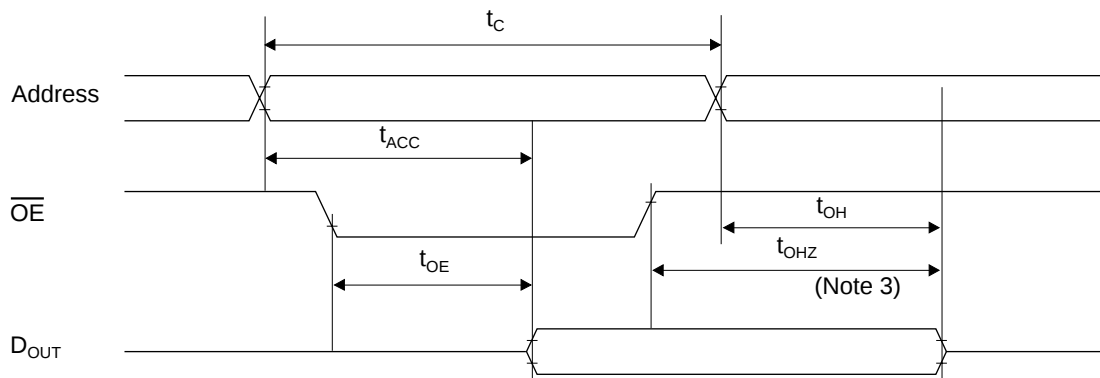
Read Cycle

(Ta = 0 to 70°C)

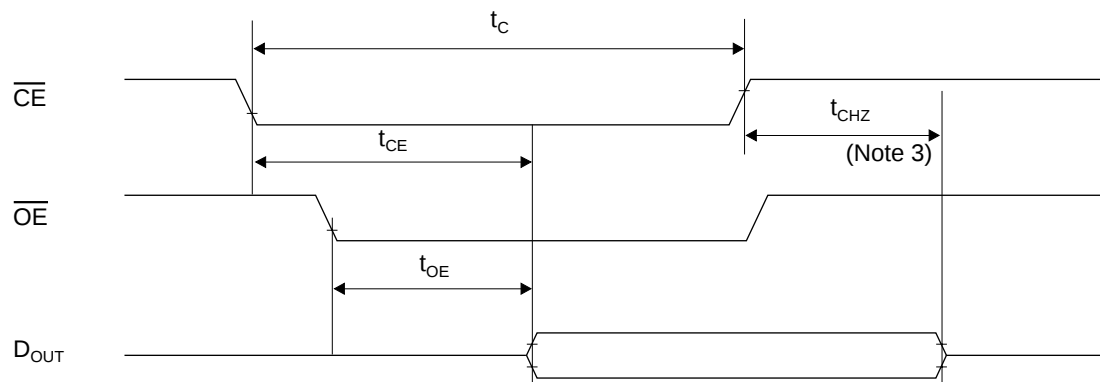
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	100	—	—	ns
Address Access time	t_{ACC}	—	—	—	100	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	100	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	50	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	40	ns
$\overline{OE}$ Output Disable time	t_{OHZ}	—	0	—	30	ns
Output Hold time	t_{OH}	—	0	—	—	ns

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Read Cycle (Note 1)



Read Cycle (Note 2)



- Note)
1. $\overline{CE}$ is low level.
 2. Address is fixed before or at the same time when $\overline{CE}$ level falls.
 3. t_{CHZ} & t_{OHZ} indicate the time until floating. They are not determined by the output level.

I/O CAPACITANCE

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_I	$V_I=0V$	—	—	8	pF
Output Capacitance	C_O	$V_O=0V$	—	—	10	pF

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ADDRESSES & SEMICONDUCTOR WEB SITES

OKI Electric Industry Co., Ltd.,

Device Business Group,
10-3, Shibaura, 4-chome,
Minato-ku, Tokyo 108, Japan,
Tel.: +81-(0)3-5445-6327,
Fax.: +81-(0)3-5445-6328,
<http://www.oki.co.jp/OKI/DBG/english/index.htm>
(NOTE: URL is case sensitive)

OKI Semiconductor Group,

785 North Mary Avenue,
Sunnyvale, CA 94086, U.S.A.,
Tel.: +1-408-720-1900,
Fax.: +1-408-720-1918,
<http://www.okisemi.com/>

OKI Electric Europe GmbH,

Head Office Europe,
Hellersbergstrasse 2,
D-41460 Neuss, Germany,
Tel: +49-2131-15960,
Fax: +49-2131-103539,
<http://www.oki-europe.de/>

OKI Electronics (Hong Kong) Ltd.,

Suite 1901-1&19, Tower 3,
China Hong Kong City,
33 Canton Road, Tsimshatsui,
Kowloon, Hong Kong,
Tel.: +852-2-736-2336,
Fax.: +852-2-736-2395

OKI Semiconductor (Asia) Pte. Ltd.,

78 Shenton Way 09-01,
Singapore 0207,
Tel.: +65-221-3722,
Fax.: +65-323-5376

OKI Semiconductor (Asia) Pte. Ltd.,

Taipei Branch,
7th Fl. No.260, Tun Hwa North Road,
Taipei, Taiwan, R.O.C.,
Sumitomo-Flysun Building,
Tel.: +886-2-2719-2561,
Fax.: +886-2-2715-2892
<http://www.oki.net.tw/>

For further information, please contact:

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